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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/942,835

08/30/2001

John Robertson Tower

SAR 14108

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06/17/2004

RATNERPRESTIA

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EXAMINER

GEBREMARIAM, SAMUEL A

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/942,835

Applicant(s)

TOWER ET AL.

Examiner

Samuel A Gebremariam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,7-11,13-18,20,21,31 and 32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,7-11,13-18,20,21,31 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 11 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation "apparatus for stabilizing the inter-electrode gap selected from a group consisting of: a semiconductor region of the first conductivity type but having a different dopant concentration than the substrate, in the inter-electrode gap; and means for applying respective bias potentials to the at least two gate electrodes, the bias potentials being sufficient to cause a fringing field to extend across the inter-electrode gap from at least one of the at least two gate electrodes" as recited in claims 1, 11 and 18 appears to be unclear. The claim as stated implies that the apparatus for stabilizing the inter-electrode gap can either be "a semiconductor region of the first conductivity type but having a different dopant concentration than the substrate, in the inter-electrode gap" or means for applying respective bias potentials to the at least two gate electrodes, the bias potentials being sufficient to cause a fringing field to extend across the inter-electrode gap from at least one of the at least two gate electrodes. Is applicant trying to state "apparatus for stabilizing the inter-electrode gap comprising ... a semiconductor region ... two gate electrodes"?

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujii US patent No. 4,952,523.

Regarding claim 1, Fujii teaches (figs. 8 and 9) a charge coupled device made on a substrate of a first conductivity type (10), the charge coupled device comprising: a dielectric layer (12) overlaying at least a portion of the substrate, and at least two gate electrodes (42, 44) overlaying the dielectric layer, the at least two gate electrodes configured to define at least two charge wells (the n and p regions of the substrate), the at least two gate electrodes being separated by an inter-electrode gap (the gap between 42 and 44) and apparatus for stabilizing the inter-electrode gap, is a semiconductor region (36) of first conductivity type but having a different dopant concentration than region (32), in the inter-electrode gap.

The recitation of "a charge coupled device made according to a standard CMOS process on a substrate of a first conductivity type" is not given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to

stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding claim 32, Fujii teaches (fig. 6) substantially the entire claimed structure of claim 1 above including the at least two gate electrodes include polysilicon gate electrodes (column, 11, lines 10-14).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 7, 8-11, 13-15, 18, 20, 21 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii in view of Ohsawa et al. US patent No. 5,210,433.

Regarding claim 3, Fujii teaches (figs. 8 and 9) substantially the entire claimed structure of claim 1 above except explicitly stating that a further dielectric layer formed over the at least two gate electrodes; and a further gate electrode formed overlying the further dielectric layer and positioned over the inter-electrode gap.

Ohsawa teaches forming dielectric layer (44) over at least two gate electrodes (80) and forming a further electrode (82a) overlying the further dielectric layer and positioned over the inter-electrode gap (region between electrodes 80).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the further dielectric layer and the further gate electrode taught by Ohsawa in the structure of Fujii in order to control the gap potential.

Regarding claim 7, Fujii teaches substantially the entire claimed structure of claim 1 above including the means for stabilizing the inter-electrode gap includes means for applying respective bias potentials to the at least two gate electrodes, the bias potentials being sufficient to cause fringing fields from the at least two gate electrodes to extend into the inters electrode gap.

Ohsawa teaches (fig. 11) means for controlling gap potential. Therefore the combined structure of Fujii and Ohsawa inherently cause fringing fields as claimed in the gap region.

Regarding claim 8, Fujii teaches substantially the entire claimed structure of claim 1 above including the charge coupled device further comprises: a well region of a first conductivity type (32), adjacent to the photogate for forming a charge barrier well, the charge barrier well being configured to divert photocarriers into at least the photogate; and a diffusion region of a second conductivity type (12), different from the first conductivity type, the diffusion region being formed inside the charge barrier well and being configured as an anti-blooming drain.

The limitation that the diffusion region being formed inside the charge barrier well and being configured as an anti-blooming drain is not given patentable weight. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the

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prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Regarding claims 9 and 10, Fujii teaches substantially the entire claimed structure of claim 1 above except explicitly stating that a further well region of the first conductivity type, the further well region forming a further charge barrier well; and a plurality of further diffusion regions of second conductivity type in the further charge barrier well, the plurality of further diffusion regions forming a charge sink.

It is conventional in the art to form more than one well and barrier region in order to form charge coupled device.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form more wells and charge barrier regions in the structure of Fujii in order to form a functional device.

Regarding claim 11, Fujii teaches substantially the entire claimed structure of claim 1 above including a charge coupled device (CCD) array, the array being formed of a plurality of single polysilicon CMOS pixels, each pixel including, a first dielectric layer (12) overlaying the substrate.

The recitation "an optical sensor circuit for receiving photocarriers from a source" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190

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USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding claim 31, Fujii teaches (figs. 8 and 9) substantially the entire claimed structure of claim 11 above including an n-channel region (32). Furthermore the channel region (32) is an n well region.

Regarding claims 13-15, Fujii teaches substantially the entire claimed structure of claims 1, 8-11 above including a diffusion region of a second conductivity type (36), different from the first conductivity type, the diffusion region being formed inside the charge barrier well and being configured as an anti-blooming drain.

Regarding claims 18, 20 and 21, Fujii teaches substantially the entire claimed structure of claims 1, 8 and 11 including that the first and second electrodes are formed of polysilicon (col. 7, lines 54-70).

Fujii does not teach back illuminated imager is shielded from photocarriers generated in response to photons received at the backside of the substrate by the semiconductor junction.

Back illuminated imager is conventional structure that is well known in the art. Furthermore providing shielding structure is also known in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate back illuminated as claimed since backside illuminated image provides a smooth unobstructed entry surface over the entire span of the imaging pixel.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujii in view of Marsh et al. US patent No. 6,196,932.

Regarding claims 16 and 17, Fujii teaches a CCD imager array (fig. 8) and optical integration section (fig. 7).

Fujii does not teach a CMOS analog to digital converter coupled to receive image signals from the CCD imager array.

CMOS analog to digital converters are conventional and also taught by Marsh (col. 8, lines 55-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the conventional CMOS ADC structure taught by Marsh in the structure of Fujii.

Response to Arguments

6. Applicant's arguments filed 04/21/04 have been fully considered but they are not persuasive. Applicant argues that Fujii does not disclose the limitation that the inter-electrode gap has a stabilizing function. As discussed above a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

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Furthermore since Fujii's structure is substantially identical to the claimed structure, it inherently has the stabilizing function.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel Admassu Gebremariam whose telephone number is 703 305 1913. The examiner can normally be reached on 8:00am-4:30pm.

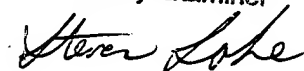
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Samuel Admassu Gebremariam
June 13, 2004

Steven Loke
Primary Examiner

A handwritten signature in black ink, appearing to read "Steven Loke", written in a cursive style.